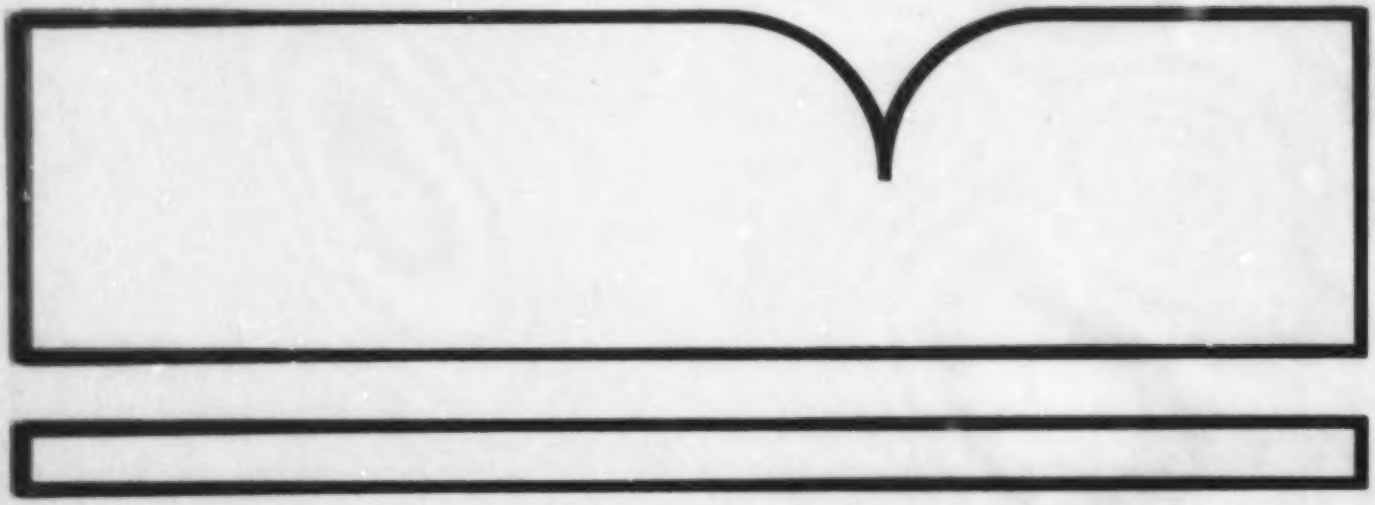
PB87-115150

Pesticide Fact Sheet Number 6: EPTC

(U.S.) Environmental Protection Agency
Washington, DC

3 Oct 83



U.S. Department of Commerce
National Technical Information Service
NTIS

PB87-101

REPORT DOCUMENTATION PAGE	1. REPORT NO.	2.	PB87-115150
4. Title and Subtitle: EPA Pesticide Fact Sheets - EPTC No. 6			5. Report Date: Issued 10/3/83
			6.
7. Author(s): EPA, Office of Pesticide Programs, Registration Division			8. Performing Organization Rept. No.: 540/FS-87- 056
9. Performing Organization Name and Address: US Environmental Protection Agency Office of Pesticide Programs Registration Division, TS-767C 401 M Street, S.W. Washington, D.C. 20460			10. Project/Task/Work Unit No. 11. Contract(C) or Grant(G) No. (C) (G)
12. Sponsoring Organization Name and Address: Same as #9			13. Type of Report & Period Covered 14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

This document contains up-to-date chemical information, including a summary of the Agency's regulatory position and rationale, on a specific pesticide or group of pesticides. A Fact Sheet is issued after one of the following actions has occurred.

1. Issuance or reissuance of a registration standard,
2. Issuance of each special review document,
3. Registration of a significantly changed use pattern,
4. Registration of a new chemical, or
5. An immediate need for information to resolve controversial issues relating to a specific chemical or use pattern.

17. Document Analysis a. Descriptors

Pesticides, regulations, Chemical Information Fact Sheet, Use Patterns, Science Findings

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

REPRODUCED BY
U.S. DEPARTMENT OF COMMERCE
NATIONAL TECHNICAL
INFORMATION SERVICE
SPRINGFIELD, VA. 22161

18. Availability Statement: Publicly Available	19. Security Class (This Report): Unclassified	21. No. of Pages: 5
	20. Security Class (This Page): Unclassified	22. Price

United States
Environmental Protection
Agency

Office of Pesticides and Toxic Substances
Office of Pesticide Programs (TS-768C)
Washington, DC 20460

EPA

Pesticide Fact Sheet

Name of Chemical: EPTC
Reason for Issuance:
Date Issued: Oct. 3, 1983
Fact Sheet Number: 6

1. Description of the chemical:

Generic name: S-ethyl dipropylthiocarbamate ($C_9H_{19}NOS$)
Common name: EPTC
Trade name: Chemolimpex®, Eptam®, and Eradicane®
EPA Shaughnessy Code: 041401
Chemical Abstracts Service (CAS) Registry number: 759-94-4
Year of initial registration: 1969
Pesticide Type: Herbicide
Chemical family: Thiocarbamate
U.S. and Foreign Producer: Stauffer Chemical Company

2. Use patterns and formulations:

Application sites: EPTC is a selective "thiocarbamate" herbicide which is registered for use in preemergent control of certain annual grasses, broadleaf weeds and perennial weeds, such as quackgrass, bermudagrass, and nutsedge on field, vegetable, orchard, ornamental and noncrop sites.
Types of formulations: EPTC is available in granular and emulsifiable liquid concentrate formulations.
Types and methods of application: EPTC must be incorporated in the soil by discing, applied with subsurface injection equipment, or metered into irrigation water to obtain proper weed control. The specific method of application and type of equipment are determined by site, formulation, and availability of equipment.
Application rates: 2.0 lbs. a.i./A to 7.0 lbs. a.i./A.
Usual carriers: Water and clay.

3. Science Findings:

Summary science statement:

EPTC is potentially a strong eye irritant but it has low acute toxicities. Since EPTC is incorporated into the soil immediately or just after planting, it will not present a hazard to birds and aquatic organisms. At least two chronic toxicology studies are required to complete the data base.

Chemical characteristics:

Technical EPTC is a light yellow liquid. At room temperature, EPTC is a liquid and it has an amine odor. EPTC boils at ca 235° C. The chemical does not present any unusual handling hazards.

Toxicological characteristics:

Technical EPTC is potentially a strong eye irritant (Toxicity Category II). The available data also indicate that technical EPTC has relatively low acute oral, dermal, and inhalation toxicities, and low potential for primary dermal irritation.

Studies on butylate (a close structural relative of EPTC), as well as studies on EPTC itself, have indicated effects of impaired clotting function in test animals. Therefore, any additional studies on EPTC must include a test for clotting function and hematology in the protocol design to better define the effects on clotting and clearly establish a no-observed-effect-level (NOEL).

Acute toxicology studies on EPTC are as follows:

Oral LD_{50} in rats: 1,652 mg/kg body weight, Toxicity Category III
Oral LD_{50} in mice: 3,160 mg/kg body weight, Toxicity Category III
Inhalation LC_{50} in rats: 4.3 mg/l, Toxicity Category III
Dermal LD_{50} in rabbits: 2,750 mg/kg bodyweight, Toxicity Category III
Primary Eye Irritation in rabbits: severe eye irritant, Toxicity Category II
Primary Dermal Irritation in rabbits: mild skin irritant, Toxicity Category IV.

Chronic toxicology studies on EPTC are as follows:

In a 54-week feeding study of EPTC in rats: the NOEL was 20 mg/kg/day; the LEL was 80 mg/kg/day.
In a two year chronic feeding and oncogenicity study of EPTC in mice: the NOEL was 20 mg/kg/day; the LEL was 80 mg/kg/day and no evidence of tumorigenicity was found.
General metabolism: EPTC studies in male and female rats were reviewed and satisfied the current data requirements for animal metabolism.

Major routes of human exposure:

Current data does not indicate that the U.S. population is exposed to EPTC through the dietary or non-dietary routes.

Physiological and Biochemical Behavioral Characteristics:

Foliar absorption: EPTC is absorbed mostly through the plant roots with little or no foliar penetration.
Translocation: EPTC is readily absorbed by roots and translocated upward to the leaves and stems.
Mechanism of pesticidal action: EPTC disrupts the growth of meristematic regions of the leaves and protein synthesis.
Metabolism and Persistence in Plants: EPTC is rapidly metabolized by plants to CO_2 and common plant constituents (amino acids and fructose).

Environmental characteristics:

Adsorption and leaching characteristics in basic soil types: EPTC is adsorbed onto dry soil. The amount of leaching decreases as clay and organic matter increases.
Microbial breakdown: Microbes are the primary factor in the breakdown of EPTC in soils.
Loss from photodecomposition and/or volatilization: EPTC is readily lost from volatilization unless it is immediately incorporated in the soil at time of application.
Average persistence at recommended rates: The half life of EPTC in moist loam soil at 21 to 27C° is approximately one week.

Ecological characteristics:

Avian oral LD_{50}: > 26,000ppm,
Avian dietary LC_{50}: > 20,000 ppm,
Fish LC_{50}: 17.0 ppm to 27.0 ppm,
Problems with aquatic organisms are not anticipated because an estimated environmental concentration of 0.141 ppm in EPTC runoff is well below the LC_{50} for aquatic organisms.
The low toxicity and placement of EPTC into the soil immediately prior to or just after planting should reduce exposure and provide an adequate safety margin.

Tolerance assessment:

Tolerances are established for negligible residues (N) of the herbicide S-ethyl dipropylthiocarbamate in or on the following raw agricultural commodities:

Commodity	Parts per million
Almonds, hulls	0.1(N)
Asparagus	0.1(N)
Beans, castor	0.1(N)
Cotton, forage	0.1(N)
Cottonseed	0.1(N)
Flaxseed	0.1(N)
Fruits, citrus	0.1(N)
Fruits, small	0.1(N)
Grain crops	0.1(N)
Grasses, forage	0.1(N)
Legumes, forage	0.1(N)
Nuts	0.1(N)
Pineapples	0.1(N)
Safflower, seed	0.1(N)
Strawberries	0.1(N)
Sunflower, seed	0.1(N)
Vegetables, fruiting	0.1(N)
Vegetables, leafy	0.1(N)
Vegetables, root crop	0.1(N)
Vegetables, seed and pod	0.1(N)

Problems known to have occurred with use:

The Pesticide Incident Monitoring System (PIMS) indicated at least four cases involving EPTC alone from 1966 to 1979. In these reports, agricultural workers such as mixers, loaders and applicators received medical treatment after the pesticide contacted their eyes. The exposures were caused by equipment failure, or splashing and resulted in irritation, swelling, redness, and inflammation of the eyes. No fatalities were reported. PIMS is a voluntary reporting system and does not include detailed followup or validation of reported incidents.

4. Summary of regulatory position and rationale:

Use classification:

General use classification.

Use, formulation or geographical restrictions:

No use, formulation, or geographical restrictions are required.

Unique label warning statement:

None

Summary of risk/benefit review:
No risk assessments were conducted.

5. Summary of major data gaps:

The following toxicological studies are required within four years after the receipt of the guidance package.

A 1-year or longer dog feeding study,
A rat oncogenicity study,
A teratology study in two species*,
A 2-generation reproduction study**.

* A teratology study (CDL:247780) submitted by Stauffer Chemical Company is pending review by the Agency.

** A reproduction study (CDL:249077) submitted by Stauffer Chemical Company is pending review by the Agency.

The requirement for a subchronic neurotoxicity study is being deferred until an acute neurotoxicity study has been completed in order to determine whether the subchronic study is necessary. This study must be submitted within six months after receipt of the guidance package.

The following environmental fate data are required within four years after the receipt of the guidance package.

Hydrolysis test,
Photodegradation test in water,
Metabolism test in anaerobic soil,
Mobility (volatility) test in the lab,
Dissipation study in soil,
Accumulation study in combined rotational crops.

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